

Evaluations of fresh-salt water interface in the coastal zone using resistivity method

Tomotoshi Ishitobi[1]; Makoto Taniguchi[1]; Yu Umezawa[1]; Jun Shimada[2]; Shinichi Onodera[3]

[1] RIHN; [2] Grad. Sch. of Sci. & Tech., Kumamoto Univ.; [3] Integrated Sci., Hiroshima Univ

The end of groundwater flow is discharge to the sea and there is the fresh-salt water interface in the point where terrestrial groundwater reaches seawater. Several methods such as analysis of the groundwater salinity are done to evaluate of fresh-salt water interface. Recently, resistivity method is applied for this phenomenon. We introduce some results which were clarified from resistivity measurements to estimate the change and the position of fresh-salt water interface in the coastal zone.

Study area is the coastal zone of Asia such as Yatsushiro Sea, Kumamoto; Seto-inland sea; Manila bay, the Philippines; Mouth of Chao Phraya River, Thailand and Jakarta bay, Indonesia. Research method is the measurement of resistivity under the seabed using resistivity method and analysis was done using RES2DINV.

As the results, it is seen that the correlation between the change of fresh-salt water interface and the change of daily tide from the results of continuously measurements of resistivity under the seabed. Moreover, it is also seen that the fresh-salt water interface shift to offshore in low tide of spring tide than low tide of neap tide. Therefore, it is clarified that the change and position of fresh-salt water interface is influenced by tidal change. According to the comparison of results every field site, fresh-salt water interface is not seen under the beach in the area where the decreasing of groundwater level occurs such as the coastal zone of Manila Bay, the Philippines. On the other hand, fresh-salt water interface shifts to offshore in the area which groundwater is abundant such as Yatsushiro Sea, Kumamoto. Measurements of groundwater discharge rates and conductivity of groundwater discharge from the seabed supports results of resistivity measurement.